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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/688,837	10/17/2003	Hiroaki Segawa	U 014860-4	9440

7590 10/06/2005

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EXAMINER

SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/688,837

Applicant(s)

SEGAWA ET AL.

Examiner

Callie E. Shosho

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>7/19/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority based on applications filed in Japan on 10/22/03 and 10/16/03. It is noted, however, that applicant has not filed a certified copy of either of the Japanese applications as required by 35 U.S.C. 119(b).

Claim Objections

2. Claims 7, 11, and 16 objected to because of the following informalities:

(a) Claim 7, line 1, it is advised that "caim" is changed to "claim".

(b) In claims 11 and 16 it is not clear why parentheses are used when defining substituents for formula (1) and formula (2) respectively. It is advised that the parentheses are removed from each claim.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this

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subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 2, 12-13, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Suzuki et al. (U.S. 6,245,832).

Suzuki et al. disclose ink jet ink comprising pigment dispersed in solvent, 1-60% glycol ether such as diethylene monobutyl ether, 0.001-1% acetylene glycol, and dispersant obtained from 40-80 mol% monomer including vinyl sulfonic acid, styrene sulfonic acid, and sulfonated naphthalene and 20-60 mol% styrene. There is also disclosed process for applying the ink to recording medium to form image (col.1, lines 5-8, col.2, line 66-col.3, line 14, col.3, lines 29-30 and 39-42, col.5, lines 33-35, and col.7, lines 1-4, 11-16, 31-35, and 67). There is no disclosure of the amount of monomers that comprise the dispersant in wt.% as presently claimed. However, for dispersant obtained from 40 mol% vinyl sulfonic acid and 60 mol% styrene, it is calculated (using molecular weight of vinyl sulfonic acid and styrene) that the dispersant contains approximately 62 wt.% styrene and 38 wt.% vinyl sulfonic acid.

In light of the above, it is clear that Suzuki et al. anticipate the present claims.

5. Claims 1-2 and 17-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Hirasa et al. (U.S. 5,919,294).

Hirasa et al. disclose ink jet ink comprising pigment dispersed in solvent and dispersant obtained from styrene and styrene sulfonic acid. There is also disclosed process for applying the ink to recording medium to form image (col.1, lines 5-7, col.3, lines 7-25 and 47-48, col.4, lines 1-15, and col.5, lines 18-22). Attention is drawn to example 1 utilizing copolymer comprising

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styrene and styrene sulfonic acid in molar ratio of 7/3 from which it is calculated that the copolymer contains 70 mol% styrene and 30 mol% styrene sulfonic acid from which it is calculated (using molecular weights of styrene and styrene sulfonic acid) that the copolymer contains approximately 59 wt.% styrene and 41 wt.% styrene sulfonic acid.

In light of the above, it is clear that Hirasa et al. anticipate the present claims.

6. Claims 1-4 and 17-18 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuru et al. (U.S. 2004/0030002).

Tsuru et al. disclose ink jet ink comprising pigment, dispersant, and polymer obtained from 3-40% salt-forming monomer that includes styrene sulfonic acid and 15-80% copolymerizable monomer that includes styrene. It is disclosed that at least 60% styrene is utilized. There is also disclosed process for applying the ink to recording medium to form image (paragraphs 2, 17, 21-22, 32-33, 51, 53, 60-61, 64, 66, 68, 112, 114, and 117).

In light of the above, it is clear that Tsuru et al. anticipate the present claims.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 5-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuru et al. (U.S. 2004/003002) in view of EP 1203737.

The disclosure with respect to Tsuru et al. in paragraph 6 above is incorporated here by reference.

The difference between Tsuru et al. and the present claimed invention is the requirement in the claims of specific dispersant.

EP 1203737, which is drawn to ink jet ink, disclose dispersing pigment using styrene-acrylic acid dispersant in order to realize high glossy image (paragraphs 40, 42, and 44).

In light of the motivation for using specific dispersant disclosed by EP 1203737, it therefore would have been obvious to one of ordinary skill in the art to use such dispersant as the dispersant in Tsuru et al. in order to produce ink that produces high glossy image, and thereby arrive at the claimed invention.

10. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (U.S. 6,245,832), Hirasa et al. (U.S. 5,919,294), or Tsuru et al. (U.S. 2004/0030002) any of which in view of Han-Adebukun et al. (U.S. 6,666,553).

The disclosures with respect to Suzuki et al., Hirasa et al., and Tsuru et al. in paragraphs 4, 5, and 6, respectively, are incorporated here by reference.

The difference between Suzuki et al., Hirasa et al., or Tsuru et al. and the present claimed invention is the requirement in the claims of 1,2-alkanediol.

Han-Adebukun et al., which is drawn to ink jet ink, disclose the use of 1,2-hexanediol as humectant to help prevent ink from drying out or crusting in the orifices of the ink jet printer (col.7, lines 32-33 and 40).

In light of the motivation for using 1,2-hexanediol disclosed by Han-Adebukun et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use 1,2-hexanediol in the ink jet ink of Suzuki et al., Hirasa et al., or Tsuru et al. in order to prevent ink from drying out or crusting in the orifices of the ink jet printer, and thereby arrive at the claimed invention.

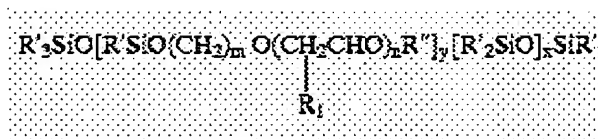
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11. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. (U.S. 6,245,832), Hirasa et al. (U.S. 5,919,294), or Tsuru et al. (U.S. 2004/0030002) any of which in view of either Pearlstine et al. (U.S. 6,087,416) or Nichols et al. (U.S. 6,124,376).

The disclosures with respect to Suzuki et al., Hirasa et al., and Tsuru et al. in paragraphs 4, 5, and 6, respectively, are incorporated here by reference.

The difference between Suzuki et al., Hirasa et al., or Tsuru et al. and the present claimed invention is the requirement in the claims of polyether-modified organosiloxane.

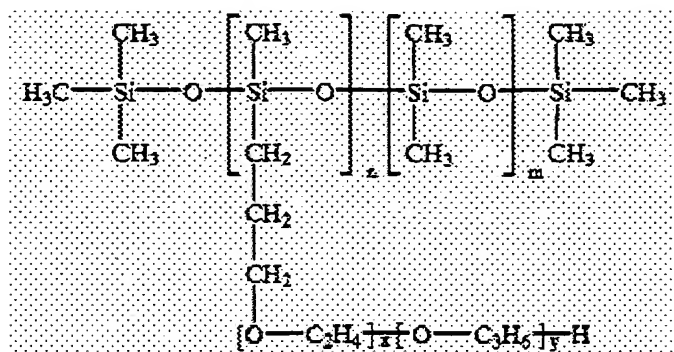
Pearlstine et al., which is drawn to ink jet inks, disclose the use of 1-6% silicone surfactant that is polyether modified organosiloxane of the formula:



where R' is methyl group, R'' is hydrocarbon chain, and R^1 is hydrogen for ethylene oxide and CH_3 for propylene oxide wherein the polyether chain can be ethylene oxide and/or propylene oxide. The motivation for using such surfactant is to effectively wet the surface of the substrate (col.4, lines 23-44 and col.6, lines 59-67).

Alternatively, Nichols et al., which is drawn to ink jet inks, disclose the use of polymer of the formula:

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where x is 8-60, y is 2-20, n is 3-60, and m is 10-98. The motivation for using such polymer is to decrease edge raggedness of ink image on substrate, reduce stitch mottle, and reduce wet smear (col.8, lines 1-22 and col.13, lines 12-col.14, line 20).

In light of the motivation for using specific compound disclose by Pearlstine et al. or Nichols et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such compound in the ink jet ink of Suzuki et al., Hirasa et al., or Tsuru et al. in order to produce ink which effectively wets the surface of the substrate or, alternatively, decreases edge raggedness of ink image on substrate, reduces stitch mottle, and reduces wet smear, and thereby arrive at the claimed invention.

12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable Suzuki et al. (U.S. 6,245,832) in view of Watanabe et al. (U.S. 6,274,646).

The disclosure with respect to Suzuki et al. in paragraph 4 above is incorporated here by reference.

The difference between Suzuki et al. and the present claimed invention is the requirement in the claims of specific glycol ether.

Suzuki et al. disclose the use of glycol ethers such as diethylene glycol monomethyl ether.

Watanabe et al., which is drawn to ink jet ink, disclose the use of triethylene glycol monobutyl ether in order to prevent clogging of the printer nozzle. Watanabe et al. also disclose the equivalence and interchangeability of diethylene glycol monomethyl ether, as disclosed by Suzuki et al., and triethylene glycol monobutyl ether, as presently claimed (col.3, lines 31-35 and 44-48).

In light of the above, it therefore would have been obvious to one of ordinary skill in the art to use triethylene glycol monobutyl ether in the ink of Suzuki et al. in order to produce ink which will not clog printer nozzles, and thereby arrive at the claimed invention.

13. Claims 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable Hirasa et al. (U.S. 5,919,294) or Tsuru et al. (U.S. 2004/0030002) either of which in view of Watanabe et al. (U.S. 6,274,646).

The disclosures with respect to Hirasa et al. and Tsuru et al. in paragraphs 5 and 6, respectively, are incorporated here by reference.

The difference between Hirasa et al. or Tsuru et al. and the present claimed invention is the requirement in the claims of glycol ether.

Watanabe et al., which is drawn to ink jet ink, disclose the use of triethylene glycol monobutyl ether in order to prevent clogging of the printer nozzle (col.3, lines 31-35 and 44-48).

In light of the motivation for using glycol ether disclosed by Watanabe et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use triethylene glycol monobutyl ether in the ink of Hirasa et al. or Tsuru et al. et al. in order to produce ink which will not clog printer nozzles, and thereby arrive at the claimed invention.

14. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. (U.S. 5,919,294) or Tsuru et al. (U.S. 2004/0030002) either of which in view of EP 1153992.

The disclosures with respect to Hirasa et al. and Tsuru et al. in paragraphs 5 and 6, respectively, are incorporated here by reference.

The difference between Hirasa et al. or Tsuru et al. and the present claimed invention is the requirement in the claims of acetylene glycol.

EP 1153992, which is drawn to ink jet inks, disclose the use of 0.1-5% acetylene glycol surfactant (paragraphs 52-55) in order to control the surface tension of the ink and the wetting of the substrate.

In light of the motivation for using acetylene glycol surfactant disclosed by EP 1153992 as described above, it therefore would have been obvious to one of ordinary skill in the art to use such surfactant in the ink jet ink of either Hirasa et al. or Tsuru et al., and thereby arrive at the claimed invention.

15. Claims 1-6 and 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1203797.

EP 1203797 discloses ink jet ink comprising ink, pigment dispersed by dispersant such as styrene-acrylic acid in solvent, glycol ether such as triethylene glycol monobutyl ether, acetylene glycol, and sulfonyl group containing (co)polymer in the form of an emulsion wherein the (co)polymer is either diene-based or non-diene based which is an acryl based sulfonyl group containing polymer. It is disclosed that both the diene-based and the non-diene based copolymer is obtained from styrene while it is further disclosed that for the non-diene based copolymer, the amount of styrene is 5-80% (paragraphs 1, 13-23, 25, 27, 40, 42, 44, 57-63, 68, 70-71, 73, 80-85, 95, and 104).

There is no explicit disclosure in EP 1203797 of ink comprising copolymer containing 30-60% styrene and C₅ or higher diene compound and/or non-diene compound as required in the present claims.

However, attention is drawn to paragraphs 95 and 104 of EP 1203797 that discloses ink comprising pigment, styrene-acrylic acid dispersant, Surfynol, i.e. acetylene glycol, triethylene glycol monobutyl ether, and sulfonated polymer obtained from 40% styrene and butadiene.

There is no disclosure in the example that the diene is C₅ or higher diene.

However, given that EP 1203737 discloses equivalence and interchangeability of using C₄ diene with C₅-C₁₀ diene (paragraph 59), it therefore would have been obvious to one of ordinary skill in the art, absent evidence to the contrary, to use any diene, including C₅-C₁₀ diene as required in present claims, in the copolymer with 40% styrene, and thereby arrive at the claimed invention.

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16. Claims 7-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1203797 as applied to claims 1-6 and 12-18 above, and further in view of Han-Adebukun et al. (U.S. 6,666,553).

The difference between EP 1203797 and the present claimed invention is the requirement in the claims of 1,2-alkanediol.

Han-Adebukun et al., which is drawn to ink jet ink, disclose the use of 1,2-hexanediol as humectant to help prevent ink from drying out or crusting in the orifices of the ink jet printer (col.7, lines 32-33 and 40).

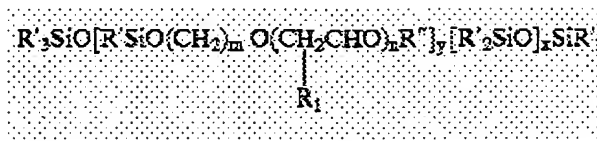
In light of the motivation for using 1,2-hexanediol disclosed by Han-Adebukun et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use 1,2-hexanediol in the ink jet ink of EP 1203797 in order to prevent ink from drying out or crusting in the orifices of the ink jet printer, and thereby arrive at the claimed invention.

17. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1203797 as applied to claims 1-6 and 12-18 above, and further in view of either Pearlstine et al. (U.S. 6,087,416) or Nichols et al. (U.S. 6,124,376).

The difference between EP 1203797 and the present claimed invention is the requirement in the claims of polyether-modified organosiloxane.

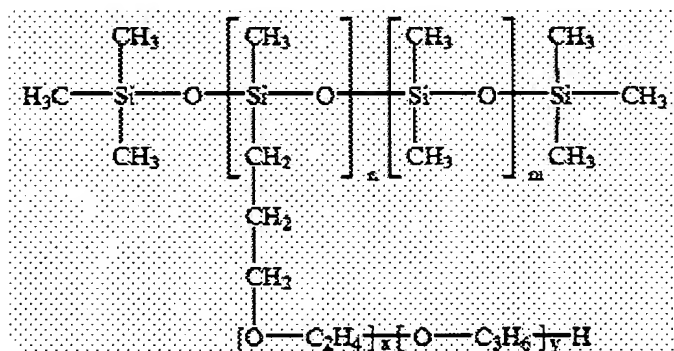
Pearlstine et al., which is drawn to ink jet inks, disclose the use of 1-6% silicone surfactant that is polyether modified organosiloxane of the formula:

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where R' is methyl group, R'' is hydrocarbon chain, and R¹ is hydrogen for ethylene oxide and CH₃ for propylene oxide wherein the polyether chain can be ethylene oxide and/or propylene oxide. The motivation for using such surfactant is to effectively wet the surface of the substrate (col.4, lines 23-44 and col.6, lines 59-67).

Alternatively, Nichols et al., which is drawn to ink jet inks, disclose the use of polymer of the formula:



where x is 8-60, y is 2-20, n is 3-60, and m is 10-98. The motivation for using such polymer is to decrease edge raggedness of ink image on substrate, reduce stitch mottle, and reduce wet smear (col.8, lines 1-22 and col.13, lines 12-col.14, line 20).

In light of the motivation for using specific compound disclose by Pearlstine et al. or Nichols et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use such compound in the ink jet ink of EP 1203797 in order to produce ink which

effectively wets the surface of the substrate or, alternatively, decreases edge raggedness of ink image on substrate, reduces stitch mottle, and reduces wet smear, and thereby arrive at the claimed invention.

18. Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Segawa et al. (U.S. 2004/0024086).

Segawa et al. disclose ink jet ink comprising ink, pigment dispersed by dispersant such as styrene-acrylic acid in solvent, polyethylene-modified organosiloxane identical to that presently claimed, 1,2-alkanediol such as 1,2-hexanediol, glycol ether such as triethylene glycol monobutyl ether, acetylene glycol, and sulfonyl group containing (co)polymer in the form of an emulsion wherein the (co)polymer is either diene-based or non-diene based which is an acryl based sulfonyl group containing polymer. It is disclosed that both the diene-base and the non-diene based copolymer is obtained from styrene while it is further disclosed that for the non-diene based copolymer, the amount of styrene is 5-80% (paragraphs 1, 11, 14-16, 27, 34-36, 38-43, 51-52, 63, 65-67, 80, 89, 113, 116, and 122).

There is no explicit disclosure in Segawa et al. of ink comprising copolymer containing 30-60% styrene and C₅ or higher diene compound and/or non-diene compound as required in the present claims.

However, attention is drawn to paragraphs 116 and 122 of Segawa et al. that discloses ink comprising pigment, styrene-acrylic acid dispersant, polyether-modified organosiloxane, triethylene glycol monobutyl ether, and sulfonated polymer obtained from 40% styrene and butadiene.

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There is no disclosure in the example that the diene is C₅ or higher diene.

However, given that Segawa et al. discloses equivalence and interchangeability of using C₄ diene with C₅-C₁₀ diene (paragraph 40), it therefore would have been obvious to one of ordinary skill in the art, absent evidence to the contrary, to use C₅-C₁₀ diene in the copolymer with 40% styrene, and thereby arrive at the claimed invention.

19. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Hidaka et al. (U.S. 2001/0023265) discloses ink comprising polymer obtained from sulfonic acid group containing monomer and styrene, however, there is no explicit disclosure of polymer obtained from 30-60% styrene and sulfonic acid group containing monomer as presently claimed.

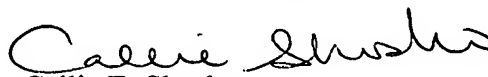
JP 11217525 discloses ink comprising sulfonated styrene-diene copolymer, however, there is no explicit disclosure of polymer obtained from 30-60% styrene and C₅ or higher diene as presently claimed.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Callie E. Shosho
Primary Examiner
Art Unit 1714

CS
10/1/05